

### Remarks

Pursuant to the Examiner's request, the pending claims are attached as an Appendix, and a duplicate copy of this response is provided on a 3½ inch IBM format floppy disk.

Applicants wish to initially note that the Clark et al. patent, the Alpert et al. patent and the present application are commonly assigned to International Business Machines Corporation. In addition, Carl E. Clark is a common inventor to the Clark et al. patent, the Alpert et al. patent, and the present application. Mr. Clark has contributed to this Response to Office Action, and the following remarks are offered in an attempt to advance prosecution of the application.

Claims 1-31 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Clark et al. (U.S. Patent No. 5,361,356) in view of Alpert et al. (U.S. Patent No. 5,493,661). This rejection is respectfully, but most strenuously, traversed and reconsideration thereof is requested.

An "obviousness" determination requires an evaluation of whether the prior art taken as a whole would suggest the claimed invention taken as a whole to one of ordinary skill in the art. In evaluating claimed subject matter as a whole, the Federal Circuit has expressly mandated that functional claim language be considered in evaluating a claim relative to the prior art. Applicants respectfully submit that the application of these standards to their independent claims leads to the conclusion that the recited subject matter would not have been obvious to one of ordinary skill in the art based on the Clark et al. and Alpert et al. patents.

In accordance with the pending independent claims (e.g., claim 1), applicants disclose a technique for producing a secure subspace for a transaction. The technique includes, from an operating system task, attaching a subtask that will restrict application addressing. The operating system task has an associated dispatchable unit access list (DU-AL) with a plurality of subspace address environments and home space defined as base space. The attaching of the subtask includes defining one subspace address environment of the plurality of subspace address environments as home space within a dispatchable unit access list (DU-AL) associated with the subtask. The DU-AL associated with the subtask includes only the home space definition.

In comparison, Clark et al. disclose storage isolation with a subspace-group facility. A Branch in Subspace Group (BSG) instruction is executed in problem state (for example, by an application program) for providing a fast instruction branch between address spaces within a restricted group of address spaces called a subspace group. This subspace group contains two types of address spaces: a base space and any number of subspaces. This subspace group is set up in a control table associated with each dispatchable unit (DU).

Initially, applicants respectfully submit that the Clark et al. disclosure and applicants' claimed invention comprise distinct processes. For example, applicants recite from an operating system task having an associated dispatchable unit access list (DU-AL) with a plurality of subspace address environments and home space defined as base space, attaching a subtask that will restrict application processing. This functionality is not described or suggested by Clark et. al.

For an alleged teaching of this aspect of applicants' invention, the Office Action references page 8, lines 25-34, as well as page 7, lines 30-56 of the printout copy of Clark et. al. mailed with the Office Action. However, a careful reading of this material, fails to uncover any teaching or suggestion of a technique where a subtask is attached from an operating system task, let alone attaching a subtask that will restrict application addressing as recited by applicants. As used in the present application, attaching a subtask means creating a new dispatchable unit of execution, i.e., a subtask that is related to the operating system task. This meaning is reinforced in the independent claims wherein the operating system task is recited to have an associated DU-AL with a plurality of subspace address environments and home space defined as base space, and wherein the attaching includes defining one subspace address environment of the plurality of subspace address environments as home space within a DU-AL associated with the subtask.

The above recitations are contrasted with the teachings of Clark et al. which only state at page 7, lines 30-56 that addressability for a program can be restricted. This concept of restricting addressability is separate and distinct from applicants' concept of attaching a new subtask (i.e., coding a new dispatchable unit of execution). The two are non-analogous and have no relation to one another. Clark et al. simply create a temporary, limited addressability restriction on an

existing task. Because the two are distinct functions, applicants' respectfully submit that there is no anticipation of their invention based upon the teachings of Clark et al.

In addition, applicants' claimed invention modifies the content of control information on the subtask that is created. Specifically, applicants' claims recite that the attaching includes defining one subspace environment (of the plurality of subspace address environments in the DU-AL of the parent task) as home space within a dispatchable unit access list (DU-AL) associated with the attached subtask. To the extent relevant, the Clark et al. patent takes an existing task and changes certain addressing information within that task's DU-AL. Applicants' claimed invention changes control information within a DU-AL associated with a subtask from the parent task. As explained in the present application, the subtask DU-AL contains a slot which is referred to as the home space for the task. This home space is conventionally defined per task as the entire address space or base space, and a subtask conventionally has an associated DU-AL with the home space of the parent task. A careful reading of Clark et al. fails to uncover any discussion of the home space defined in particular, and thus, applicants respectfully submit that the normal address base identifier would be placed within the home space slot of any subtask created from the task discussed therein. In contrast, the present application recites limiting the defined home space in the DU-AL of the subtask to comprise a subspace address (i.e., a subspace identifier) from the plurality of subspaces listed in the DU-AL of the parent task.

Thus, the subtask that is created in applicants' process is further limited by and isolated by qualifying its home space as one subspace address environment. Further, the independent claims presented specify that the DU-AL associated with the subtask includes only the home space definition. In applicants' DU-AL of the subtask, the base space is empty except for the one subspace address environment defined as home space. In contrast, in Clark et al. a group of address subspaces are defined and included in the base space. Applicants' have advanced the state-of-the-art by producing a secure subspace for a transaction by providing functionality which allows for attaching of a new subtask from an operating system task and then defining the home space of the dispatchable unit access list associated with that new subtask to comprise one subspace address environment of the plurality of subspace address environments defined in the parent task's DU-AL. Clark et al. do not suggest or imply a similar process. In fact, the "home space" of the DU-AL is not even mentioned in page 13, lines 12-40 material of Clark et al. cited

in the Office Action for this aspect of applicants' invention, nor is the home space of the DU-AL mentioned anywhere in Clark et al.

Advantageously, the above-noted aspects of applicants recited invention provide a secure subspace for a transaction. As used in the present application, the "secure subspace" is intended to distinguish applicants recited result from that of Clark et al. In Clark et al., a subspace management capability is described which enables one to protect from inadvertent errors. The Clark et al. approach is a reliability enhancement mechanism, whereas the claimed invention protects against purposeful attempts to get around the system. This difference results from the different processes employed in the present application and the prior Clark et al. patent.

The Office Action recognizes certain deficiencies of Clark et al. when applied against their independent claims, and proposes in combination therewith the teachings of Alpert et al. for allegedly suggesting various aspects of Applicants' claimed invention. The various characterizations of the teachings of Alpert et al. stated in the Office Action, and their alleged applicability to the present invention, are respectfully traversed.

Alpert et al. describes a method and system for providing a PROGRAM CALL to a dispatchable units' base space. A program call to a dispatchable unit's (PC to DU) base space bit is added to each entry-table entry in order to determine whether PROGRAM CALL to a base space is to be made. Should the bit indicate that a PROGRAM CALL to dispatchable unit's base space is to be made, then in one embodiment, the base space number-second-table entry origin (BASTEO) and the base address space number (BASN) stored in the dispatchable unit control table (DUCT) are used in identifying the base space and accessing associated control information for the identified base space. In another embodiment, the BASN stored in the DUCT is used in ASN translation to identify the base space and access the associated control information for the base space. (See Abstract.)

Alpert et al. is first cited in the Office Action for allegedly teaching, in part, that home space is defined as base space. Applicants submit that this is exactly the state of the art from which the present invention departs. In Applicants' claimed invention, the home space is not defined as base space in the sub-task. Rather, Applicants recite defining one subspace address environment of the plurality of subspace address environments (of the operating system task POU920000030US1

having the associated DU-AL with a plurality of subspace address environments and home space defined as base space) as home space within a dispatchable unit access list (DU-AL) associated with the sub-task, and wherein the DU-AL associated with the sub-task includes only that home space definition. In Applicants' claimed process, there are two DU-ALs, one for the operating system task, and one for the associated subtask. In the associated subtask DU-AL, only one subspace address environment from a plurality of subspace address environments of the operating system task's DU-AL is defined as that subtask's home space, i.e., the DU-AL associated with the sub-task includes only this home space definition. Neither Alpert et al. nor Clark et al. suggest this processing protocol.

The Office Action alleges that the DU-AL associated with the sub-task includes only the home space definition is described in Alpert et al., citing page 10, lines 12-19. This characterization of the teachings of Alpert et al. is respectfully traversed. Page 10, lines 12-19 of Alpert et al. state:

In accordance with the principles of the present invention, the parameters used in identifying the base space and retrieving the associated control information are located in a dispatchable unit control table (DUCT) 500 (FIG. 5). Each dispatchable unit or task control block has an associated DUCT and each DUCT resides in real storage. The beginning of DUCT 500 is specified by appending six zeros to a DUCT origin (DUCTO), which is located in bits 1-25 of control register 2. The format of DUCT 500, as altered in accordance with the principles of the present invention, is depicted in FIG. 5

Applicants initially note that the cited language of Alpert et al. does not even address functionality associated with a dispatchable unit access list (DU-AL). Rather, Alpert et al. at page 10 is describing certain control information located in the dispatchable unit control table (DUCT). One skilled in the art would understand that the DUCT and the DU-AL comprise distinct lists. Reference, e.g., Enterprise Systems Architecture/390 Principles of Operation, IBM Publication No. SA22-7201-04 (June 1997) and IBM Publication No. SA22-7201-05 (Sept. 1998). In Applicants' claimed processing protocol, DU-AL lists are employed to implement the processing functions set forth in the independent claims. In contrast, Alpert et al. does not discuss DU-AL lists directly at the cited lines, but rather describes dispatchable unit control tables (DUCT).

Further, even if one were to equate a DUCT and a DU-AL as proposed in the Office Action, the resultant combination would still not achieve the processing protocol recited by Applicants in the independent claims. For example, Alpert et al. teach that the home space is defined as the base space. This is contrary to Applicants' claimed processing wherein the attaching of the sub-task from the operating system task includes defining one subspace address environment of the plurality of subspace address environments from the operating system task as home space within the dispatchable unit access list associated with the sub-task. Applicants' independent claims further recite that the DU-AL associated with the sub-task includes only this specific home space definition. Thus, in Applicants' claimed process, the home space does not comprise the entire base space for the sub-task DU-AL, but rather, only one subspace address environment from the plurality of subspace address environments of the parent operating system task is employed. No similar functionality is suggested or implied by Alpert et al.'s teachings, either alone or in combination with Clark et al.


In view of the differences resulting from the different processes employed by the present application and the Clark et al. patent and the Alpert et al. patent, Applicants respectfully submit that their invention as claimed in independent claims 1, 11, 21 & 31 would not have been obvious to one of ordinary skill in the art based thereon. Therefore, reconsideration and withdrawal of the rejection to these claims is respectfully requested.

The dependent claims are believed allowable for the same reasons as the independent claims from which they directly or ultimately depend, as well as for their own additional characterizations.

Applicants respectfully submit that all claims are in condition for allowance and such action is respectfully requested.

Applicants' undersigned attorney is available should the Examiner wish to discuss this application further.

Respectfully submitted,

  
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